

Design-Build Primer

Risk Matrix: A key element in the cost of any project is associated with risk elements. If a contractor is assigned a risk then he must determine how likely it is to occur, what the likely cost of this occurrence would be, and then assign a price to the owner for assuming this risk. Examples of this risk elements could include: Workmanship, design errors, constructability, differing site conditions, hazardous materials, etc.

During a project's inception a risk matrix should be developed. The risks allocated to the owner should be defined to an acceptable level for the owner to proceed with confidence in the future project cost. Items of risk, which will reside with a Design-Builder, should NOT be developed extensively unless the owner wishes to re-assume the associated risk.

WSDOT has an initial risk matrix developed for design teams to begin with. Once fully developed, the risk matrix will form the framework for the entire contract.

Areas where there is typically internal pressure to carry a specific design forward beyond what may be required in the risk matrix include:

- Final Traffic Lane Configuration – (locking in a solution can cause problems if the geometrics of the site do not allow the solution)
- Geotechnical – If the geotechnical criteria is not adequately defined the design-builder may assume a lower factor of safety than WSDOT is comfortable with. Providing a full analysis will require WSDOT to make assumptions as to the location and type of bridges/walls used in the project.
- Intelligent Transportation Systems (ITS): Incorporating a new ITS system into WSDOT's existing regional system may require extensive field adjustment. Requiring specific equipment/configurations places the responsibility for a working system back onto WSDOT.

WSDOT design-teams will often want to skip over this and jump right into developing the preliminary design and the RFP. However, without a clear idea of what is required WSDOT may inadvertently assume responsibility for risks that should be assigned to the design-builder.

LOI – Letters of Interest go out (and then back) to all prospective design-builders early on in the process. Early definition of the project, accompanied by a schedule, can help design-builders to determine early on if the project will fit into their projected business plan.

RFQ – The Request for Qualifications is generated by WSDOT and sent to prospective design-builders. This is the first step in a two-step proposal process. The Request for Qualifications CANNOT be solutions based. Only the qualifications of the design-builder may be considered. Financial strength, safety records, past performance, key

personnel, QA/QC approach can all be key factors. The selection process should be as transparent as possible.

Of the firms solicited, an ideal number of finalists will range from three to five.

Generally, radical differences in the proposals are rare. Increasing the number of proposers is not likely to generate a better product.

The cost of developing the final proposal can be prohibitive (Flatiron spent \$5 million on a \$1 billion project and received a \$1 million stipend). Expanding the number of design-builders competing will increase the number of companies losing money. If too many firms are short-listed some design-builders will walk away.

SOQ – The Statement of Qualifications is prepared by the Design-Builders. An owner's panel scores these SOQs. Those firms with the highest score are then invited to continue in the process.

Short Listing – The top scoring firms, based upon the SOQ, are selected to continue with the process. This completes the first step in the two step selection process.

Invitation to Bid – This can go by a number of names but it is the formal communication between WSDOT to the design-builder notifying them that they have been short-listed and that they are invited to submit a proposal. This also commits WSDOT to the paying a stipend.

RFP – The Request for Proposals - This half of the design-build contract. The RFP is WSDOT's half of the contract. It will be combined with the design-builders proposal to establish the final contract. WSDOT needs to fully describe what our end product is and how we will determine whether the end product is acceptable.

This is different from a standard design in which WSDOT generates the entire contract documents while the contractor only generates the price.

The RFP will outline how the contract will be awarded. WSDOT currently uses a combination of a technical score and the price to determine the Best Value. An excellent design may be adequate to justify a higher price while a very low price may not be enough to overcome a mediocre design.

Technical score – In the RFP WSDOT will define what is required as a result of this project and, in some cases, where WSDOT wants an extra effort or innovation. This is communicated to the design-builder through technical points. It is through these technical points that WSDOT conveys what is really important on a project. Some examples of where the designer may earn technical points are as follows:

Wetland impacts. WSDOT can provide additional technical points for designs that avoid or reduce wetland impacts.

Work Zone Traffic Control. A very innovative approach that significantly reduces traffic impacts may be desirable to WSDOT on some projects.

Duration of the project. Significantly reducing the impacts to the public may also be of value to WSDOT. If a design-builder can guarantee an early delivery of a project then WSDOT may be willing to pay a premium for this.

Responsiveness: On the reverse side, if WSDOT wants only a single solution, then there should be a contractual requirement where no variation is requested or acceptable. Pavement design, surveying and geometric design are areas where WSDOT generally wants the standards. Exceeding the standards is acceptable but WSDOT does not, as a general rule, encourage expending additional funds to do this. (These are project-by-project decisions though). In areas that WSDOT desires to only establish the minimum criteria the evaluation is essentially done on a pass/fail.

Price: This is really pretty self-explanatory.

Best Value: We take the technical score – multiply it by a fixed number (10^7) and divide it by the price of the proposal to determine the best value. A very high technical score or a very low price proposal will increase the best value score.

Proposer A:	Technical Score:	827	
	Multiplier	10^7	
	Price:	\$22,000,000	
			Best Value Score: 375.91
Proposer B	Technical Score:	720	
	Multiplier	10^7	
	Price	\$20,000,000	
			Best Value Score 360
Proposer C	Technical Score:	890	
	Multiplier	10^7	
	Price	\$24,000,000	
			Best Value Score 370.83

In this example, Proposer A would have the best value score and receive the contract. Proposer A did not have the cheapest solution OR the best design. (These scores are NOT likely to repeat in a standard project)

Also, in this example a technical point equates to ABOUT \$22 thousand dollars.

Proposal: The proposal is the design-builders way of demonstrating HOW they will meet the requirements included in the RFP. The proposal and price make up the second half of the design-build contract. The proposal is based upon the specific approach and solutions offered by the design-builder. Statements and designs included in the proposal are contractually binding and WSDOT has a legal right to expect them to be carried out.

If WSDOT required the design-builder to specify the bridge type and architectural features of the bridge in the proposal, then the bridge type the design-builder shows would be considered a contractual commitment.

Betterments: Anything that WSDOT identifies as exceeding the requirements outlined in the RFP may be termed a betterment. To avoid conflict during the contract WSDOT should try to identify all aspects of the proposal that have been identified as betterments.

For instance, if a design-builder states that they will be able to limit the wetland impacts to an amount BELOW that specified in the RFP, and then WSDOT can contractually enforce a lower impact. (On SR 500, WSDOT allowed up to 0.5 acres of impact. The winning bidder promised 0.22 acres of impact and this amount became the contractual requirement).

(On SR 500, WSDOT evaluated the final lane configuration provided by the design-builder as a significant betterment. During construction the final configuration could not be obtained due to geometric constraints. The design-builder had considered the final configuration shown as conceptual but had not stated this in the proposal.)

BAFO – Best and Final Offer – This is not currently done at WSDOT. In a BAFO the owner will negotiate with the various design-builders on their proposals. If there is a betterment offered which the owner does not value it may be dropped. If the owner wishes for improvements not included then it may be added.

Some agencies have utilized this process as a way to force design-builders to lower their price. The contracting community is strongly against this approach. To date, WSDOT has not utilized this method of negotiation.

QC/QA - Quality Control/Quality Assurance - On a design-build project the design-builder is responsible to perform all quality checks throughout the process. This responsibility extends from initial design through construction. The design-builders approach to how they will perform QC/QA is very important and is often the subject of technical score variations.

Design QC/QA is generally very well defined within the proposal.

Peer review: Review of a design by another designer within the company.

Check review: Review by a supervisor

Constructability review: Generally done by a contractor or the contractor's representative. This review focuses on balancing both the constructability of the design as well as verifying that the design offers the cheapest and fastest material.

Material availability and cost are feedback that designers do not usually have in a standard design-bid-build project. This ability to modify the design to meet the available equipment and materials is a significant advantage for design-build.

Over the shoulder review: Instead of a formal review/approval process WSDOT assumes a more informal, ongoing review of the design. WSDOT representatives are involved in design coordination meetings and input is sought out as to whether a design-approach is acceptable to WSDOT.

Rejection Authority: Again, as design responsibility stays with the design-builder WSDOT does not approve designs. However, if a design does not meet contract requirements then WSDOT has the authority to reject a design. This authority extends until the project is complete.

Construction QC/QA can vary depending upon the contract.

Statistical acceptance: Material based. This is a method of evaluating the quality of material to verify it meets the required standards.

Materials Documentation: Most of the materials used on a highway project require documentation. The required documentation may be a manufacturers certification that the material meets the standards defined by the designer, test results, or simply visual verification by the inspector.

Materials testing: This is a very broad area. Testing can be done in the field (compaction tests, air/slump tests for concrete, pressure tests for pipe, gradation tests, asphalt binder content, volumetric properties, etc.).

More complex materials tests are done at a certified AASHTO Materials References Laboratory (AASHTO 1218). The HQ Materials Lab and all Region labs are approved. Private labs can also get this certification. Tests done at a centralized lab range from testing signal controllers, asphalt testing, cylinder compression testing, binder testing, electrical testing, steel reinforcement testing, etc.)

Construction Inspection: This covers the workmanship of the project. Once the design has been completed and acceptable materials are delivered to the project they must be incorporated into the project within the allowable tolerances of the design. Inspection responsibilities on a design-build project rest with the design-builder.

QV – Quality Verification. WSDOT is not part of the formal acceptance procedures for either materials or inspection. However, WSDOT may have a responsibility to FHWA (or internal) to perform a reduced number of tests/inspections to VERIFY that the tests/inspections being performed by the design-builder are accurate. The sampling and testing done by WSDOT is to validate the quality of the product.

IAI – Independent Assurance Sampling and Testing – This can be done in lieu of the QV. An independent, third party inspection firm can be hired by both parties (WSDOT and design-builder) to perform the testing. This has the advantage of avoiding a bias for or against the contractor but is also traditionally more expensive.

Witness/Hold points. Some items on a project, no matter who is responsible for QA/QC, are too important to risk being incorporated without WSDOT review. In this case WSDOT has the right to identify them in the RFP as either Witness or Hold points. A witness point requires that WSDOT be given the opportunity to review the work prior to incorporation into the contract while a hold point requires that WSDOT approve the work.